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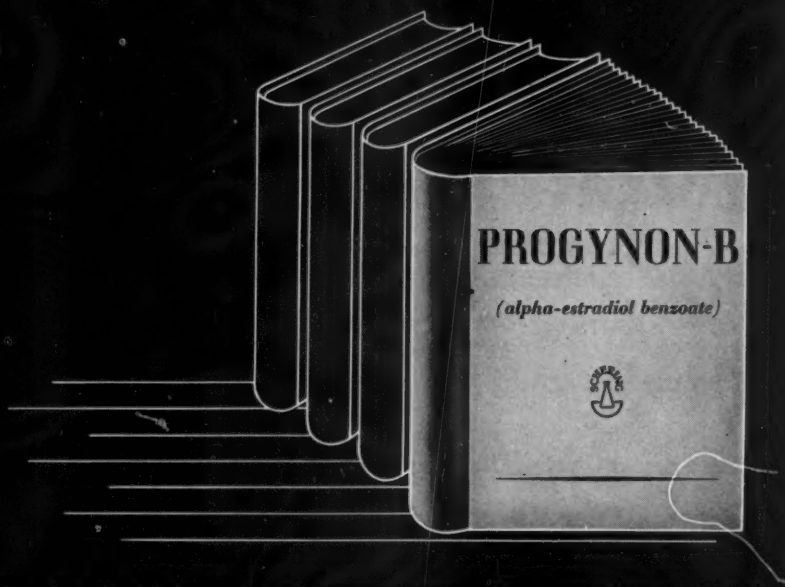

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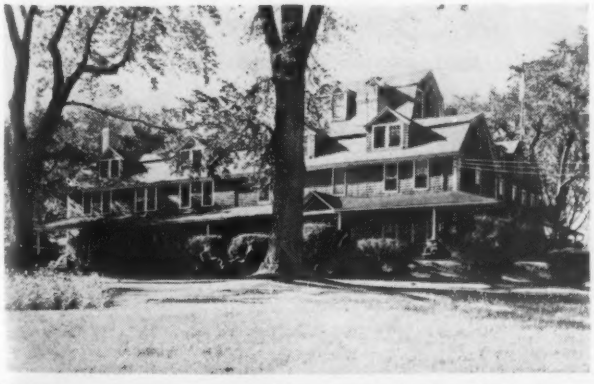

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DISEASES of the NERVOUS SYSTEM

(PUBLISHED MONTHLY)

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Evaluation of Laboratory Controlled Estrogenic Therapy in the Psychoses*

MARJORIE A. DARKEN, M.A., *and*
C. CHARLES BURLINGAME, M.D.
Hartford, Connecticut

Each new therapeutic agent which is added to the armamentarium of psychiatry for the treatment of the psychoses brings with it new hope. It is only after a long period of observation, followed by careful evaluation, that one can adjust the treatment, discern with any degree of accuracy its advantages and disadvantages, and determine the therapeutic rationale. We hope this paper will contribute toward the clarification of the use and value of estrogen therapy in the treatment of the climacterical psychoses. Its contents cover a six-year period and deal with the application of this therapy to 200 women in the climacterium. In addition, smear studies of 600 psychiatric cases either at the menopause or in the post-menopausal period are included.

It is a common aphorism that figures can be made to prove almost any point, and the numerous factors which influence the ultimate results must be kept in mind. Diagnostic policies, selection of cases, technique, and evaluation of results are some of the more obvious variables which tend to make comparisons difficult. Much variance is present in the control figures that are available for use at this time. In order to avoid complications arising from this factor, we have adhered to the policy of using for our control data of spontaneous recovery rate the maximum recorded figures which have been published in the literature to date.

*Survey from The Institute of Living, Hartford, Conn.

Diagnostic Smear Examinations

This survey was made on 600 menopausal and post-menopausal women who entered the Institute. The point should be emphasized that all were psychiatric cases. Smears were taken and stained in the conventional manner.[1,2] Evidence of atrophy was based on the presence of small, round, "deep" cells in the smear picture as contrasted with the larger, squamous epithelial tissue cells. Those smears showing either an occasional "deep" cell or no "deep" cells at all we have regarded as being non-atrophic in character. Smears with the percentage of "deep" cells varying between twenty and fifty have been diagnosed as a moderate atrophy, and those with more than fifty per cent "deep" cells present have been classified as a marked atrophy. All smears have been recently re-checked under the microscope to confirm the original diagnosis and to obliterate any technical variations.

A consideration of this group of 600 psychiatric patients as a whole gives evidence of 40 per cent with definite atrophic smear pictures. The moderate and marked atrophies are represented in approximately equal amounts with 21 per cent of the moderate and 19 per cent of the advanced being present.

The incidence of atrophy is in direct proportion to the age group concerned, consistently increasing from 8 per cent in those under 45 years of age to a maximum value of 72 per cent in those 70 years of age or over.

This straight line relationship is graphically represented in Chart I and is compiled from the figures in Table I. A division of the

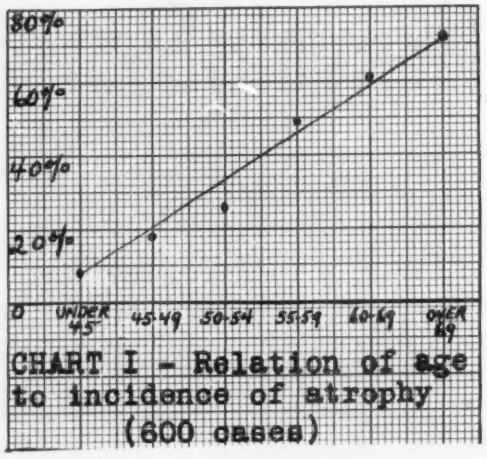

CHART I - Relation of age to incidence of atrophy (600 cases)

TABLE I
RELATION OF AGE TO INCIDENCE OF ATROPHY

Age Range	Total Number	Marked Atrophy No.	Marked Atrophy Pct.	Moderate Atrophy No.	Moderate Atrophy Pct.	Total Atrophy No.	Total Atrophy Pct.
under 45	73	3	4	3	4	6	8
45-49	128	8	6	15	12	23	18
50-54	130	17	13	17	13	34	26
55-59	101	23	23	26	26	49	49
60-69	114	36	32	34	30	70	61
over 69	54	25	46	14	26	39	72
Total	600	112	19	129	21	241	40

atrophy into moderate and marked types within each age group is not statistically valid due to the insufficient number of cases. However, it appears to be indicated that the occurrence of each type is equally represented in each group with the possible exception of the oldest group in which the marked atrophy apparently tends to exert a dominating influence.

The most revealing data obtained from the diagnostic smear examinations is that the incidence of atrophy is definitely higher in psychotic than in non-psychotic individuals. This marked distinction is illustrated in Chart II from the figures enumerated in Table II, and would appear to be in accord with Ripley

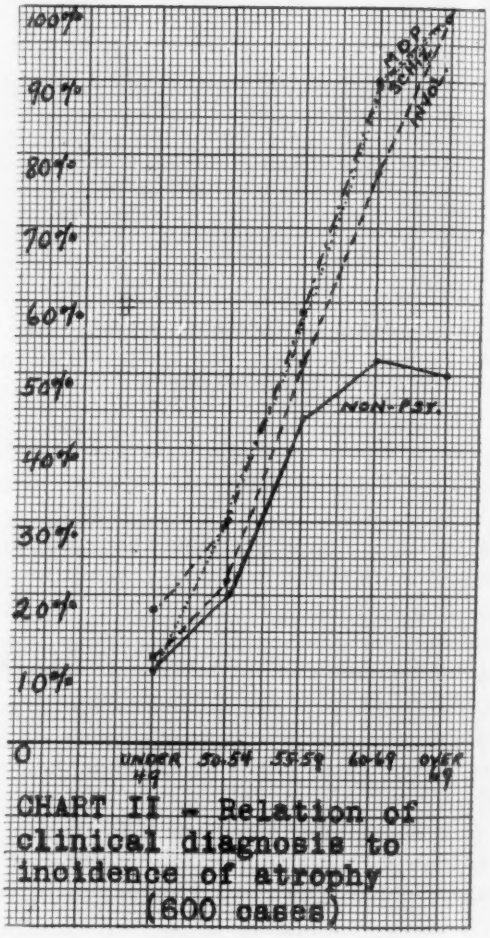

CHART II - Relation of clinical diagnosis to incidence of atrophy (600 cases)

TABLE II
RELATIONSHIP BETWEEN CLINICAL DIAGNOSIS AND INCIDENCE OF ATROPHY

Age Range	Involutional Total Cases	Involutional Atrophy No.	Involutional Atrophy Pct.	Manic-Dep. Total Cases	Manic-Dep. Atrophy No.	Manic-Dep. Atrophy Pct.	Schizophrenia Total Cases	Schizophrenia Atrophy No.	Schizophrenia Atrophy Pct.	Misc. Psychoses Total Cases	Misc. Psychoses Atrophy No.	Misc. Psychoses Atrophy Pct.	Non.-Psy. Total Cases	Non.-Psy. Atrophy No.	Non.-Psy. Atrophy Pct.
40-45	20	1	5	11	2	18	12	0	0	10	1	10	28	2	7
45-49	46	6	13	11	2	18	12	2	17	9	2	22	48	4	10
50-54	46	10	22	10	3	30	9	3	33	27	9	33	39	8	20
55-59	38	18	51	12	7	59	12	7	59	23	10	43	25	11	44
60-69	13	10	77	10	9	90	9	8	89	70	37	53	25	13	52
over 69	2	2	100	4	4	100	4	4	100	53	34	64	2	1	50

and Papanicolaou[3] who found a correlation between the severity of the psychoses and the degree of abnormality of the menstrual cycle in younger women. The three main psychotic divisions have been separated and stand well apart from the non-psychotic group. There are not a sufficient number of cases to statistically justify the drawing of any conclusions as regards the actual incidence of atrophy in the three psychotic divisions when considered separately and correspondingly related. There would appear to be no point of differentiation among these three groups on the basis of smear atrophy.

The difference between the three main psychotic groups and the non-psychotic group is more marked after the age of 55 as is shown in Table III with the atrophy progressing from

TABLE III

COMPARISON OF INCIDENCE OF ATROPHY IN PSYCHOTIC AND NON-PSYCHOTIC INDIVIDUALS

Age Range	*Non-psychotic*			*Psychotic*			
	Total Cases	*Atrophy No.*	*Pct.*	*Total Cases*	*Atrophy No.*	*Pct.*	*Incidence of increase*
45-49	48	5	10	69	10	15	+ 5%
50-54	39	8	20	65	16	25	+ 5%
55-59	43	25	44	62	37	59	+14%
60-69	25	13	52	32	29	91	+39%
over 69	2	1	50	10	10	100	+50%

a 15 per cent greater incidence in the younger group to a 39 per cent greater incidence in the 60-69 age group. The group over 69 is not large enough to permit the drawing of any conclusions.

Method of Treatment

Before instigation of therapy a complete gynecological examination was made in order to rule out any possible pelvic pathology. In the presence of personal or family history of carcinoma estrogen therapy was withheld since the innate tendency to carcinoma cannot with our present knowledge be assayed.[4]

Diagnostic smear examinations were made before therapy was started. In those persons in whom cessation of menses had occurred smears were obtained a week apart when the estrin level was reflected as being high, in order to eliminate the possibility of the occurrence of a spontaneous follicular phase. This measure has upon occasion transferred a preliminary non-atrophic individual to an atrophic classification. In those persons in whom catamenia is present a survey of the menstrual cycle should be made before dosage can be determined. This survey includes smears taken post-menstrually, at the follicular phase and at the post-ovulatory phase, and at the early and late pre-menstrual phases. From this series of smears the degree of subnormal ovarian estrogenic secretions can be estimated.

The estrogenic preparations which we have used most extensively are the di-hydrofollicular hormone or estradiol benzoate* and the ketohydroxyestrin or estrone. Our results, along with those of other investigators,[5,6] indicate estradiol benzoate to be the medication of choice in that a more rapid and prolonged microscopic response was observed and clinical progress was greater. Stilbesterol has not been employed due to the many reactions and toxic effects observed by other workers.[6,7,8] This factor is especially important in the handling of the psychiatric patient.

The program of therapy differs in the presence or absence of catamenia and is given here in more detail than in the previous publication from this department.[9] In those with catamenia present (but still, nevertheless, in the climacterial period of life) treatment has been limited to the intermenstrual period. The initial dosage has been regulated by two factors individually: (1) the degree of subnormal ovarian estrogenic secretion evidenced by the diagnostic smear picture, and (2) the clinical symptomatology present both as regards the severity of the psychosis and the severity of the vasomotor disturbances. It should be noted that relatively few of our individuals suffered from the commonly termed "menopausal syndrome" in which vasomotor symptoms are present.

Those exhibiting slightly subnormal ovarian estrogenic function and mild depression responded well to a total of 50,000 rat units with 1000 r. u. intramuscular injections being given daily for 10 days during each of five consecutive intermenstrual periods. Persons with more pronounced atrophy or more severe depressions required twice this dosage to obtain

*The preparation known as Progynon-B was made available through the courtesy of Dr. Max Gilbert, Schering Corporation, Bloomfield, N. J.

clinical response, and the most severe cases seldom responded clinically unless the dosage was tripled. The dosage following the initial injection was in all cases regulated by the microscopic and clinical response. The smear pictures served as a readily available index of estrogenic activity and reflected the amount of physiological response obtained from a given amount.

In those who were not experiencing the menstrual irregularity of the menopause and were in the post-menopausal period, estrogen therapy was administered in a continuous course. Individual dosage was again regulated according to the severity of the psychosis and the degree of smear atrophy. Courses totaled from 125,000 r. u. to 200,000 r. u. with injections being given daily for 30 to 50 days. The initial dose was 2000 r. u. daily with increases and final dosage varying according to the clinical and microscopic response. The maximum dosage varied from 3000 r. u. daily in the mild cases to 10,000 r. u. every other day in the more severe cases. If clinical improvement was not obtained following the first course, a rest period of one month was allowed before a second course was instigated.

Results of Therapy

Four observations worthy of note as regards estrogen therapy in general have been seen. The first of these is that a microscopic response indicative of a strongly expressed follicular phase is essential for clinical improvement. In none of our cases was clinical improvement noted in the absence of a physiological response. The second observation is that the changes in the smear do not necessarily parallel the course of clinical improvement. Many cases of an advanced microscopic response did not exhibit an advanced clinical response, and some individuals showing recovery from the psychotic state reached as a maximum smear response only a moderate estrogen level. Thirdly, advanced atrophies do not respond clinically as well as those evidencing less atrophy. This is seen in our 100 involutional cases which were treated. Only 28 per cent of the advanced atrophies responded while 64 per cent of the slightly subnormal and moderately atrophic individuals showed definite improvement. The last general observation is that those responding microscopically to estrogenic therapy in a shorter length of time gave some indication of a better clinical response and retained the physiological effects of therapy (as evidenced by the degree of regression in the smear pictures) for a longer period of time.

Involutional Psychoses—100 cases of involutional psychoses as diagnosed by the staff of the Institute have been treated. Of these, 75 were admitted during their first attack and their clinical symptomatology was in agreement with the pictures presented by Hoch and MacCurdy,[10] Gillespie,[11] Henderson and Gillespie[12] and Strecker.[13] It must be remembered that the consideration of the involutional psychosis as a disease entity is still in dispute and that there are innumerable modifications and distortions of the clinical picture. As far as present knowledge will permit us to determine, our 75 cases do appear to present symptoms which fall within the limits of the typical involutional psychosis picture. The age range varied from 41 to 65 years and the average duration of illness in the typical cases was 12 months. Those with recurring attacks had a longer duration period. Seventy-five per cent of those experiencing their first attack showed the pre-psychotic personalities which have been described in the literature by Titley,[14] Palmer and Sherman,[15] and others. The precipitating factors were psychic in approximately half of the individuals and the somatic and somatopsychic precipitating forces shared the remaining 50 per cent equally. The menopause was considered to be a significant factor in 40 of the individuals. However, of these 40 only 20 per cent exhibited the vasomotor symptoms commonly associated with the "menopausal syndrome." There were 8 per cent of the menopausal and 25 per cent of the post-menopausal involutional psychoses which had an associated vascular complication, and this factor appears to present an organic complex worthy of consideration.

Coincident with estrogen therapy 62 per cent of the 40 cases in which menopause was an associated factor showed improvement: 2 recovered, 10 were much improved, and 13 showed a measurable degree of clinical response.

Of the 15 post-menopausal cases associated with hypertension 47 per cent showed improvement: 2 recovered, 4 were much improved, and 1 showed definite progress.

Forty-five cases of involutional psychoses remain uncomplicated by the menopause or vascular disease. These cases are of greater significance when one considers the prevalent tendency to confuse the menopausal syndrome with the true psychotic state. These cases showed a total of 60 per cent improvement: 6 recovered, 7 were much improved, and 13 showed definite improvement. There is a margin of approximately 20 per cent above the highest reported spontaneous recovery rate of 40 per cent.[13,15,16,17]

Considering the group of 100 involutional psychoses as a whole, 58 per cent were apparently benefited: 10 recovered with full remission, 21 were much improved but recovery was not complete before discharge, and 27 showed improvement to such a degree that they were able to be cared for at home. The remaining 42 showed no fundamental change in the psychosis. This 58 per cent figure based on the group as a whole is slightly in excess of the composite figures published by Danziger[18] correlating the work of various investigators and justifying the rationale of treating with estrogens all patients suffering from depressions associated with the menopause.

A consideration of these 100 involutional psychoses on the basis of the degree of atrophy reflected in the smear picture brings out the interesting contrast previously noted under "general observations," namely, that while only 28 per cent of the advanced atrophies responded, 64 per cent of the less severe atrophies showed improvement. Of the 18 advanced atrophies 5 (28 per cent) improved, of the 20 moderate atrophies 13 (65 per cent) improved, and of the very mildly atrophic and non-atrophic 40 (64 per cent) of the 62 improved.

Comparing the group of 75 involutional psychoses experiencing their first attacks with the 25 multiple attack individuals we find a significant difference even when taking into account the equal percentage of post-menopausal vascular cases that occur. Figures tend to indicate a higher rate of improvement in those having their first attack than in those with previous psychotic episodes. Those in whom there had been more than one attack showed 45 per cent improvement and those in whom there was no history of previous attack showed a total improvement of 67 per cent. These figures substantiate those of Brew and Davidoff[19] and Davidoff and Goodstone[20] who find best results with mild and moderately severe psychotic types. The severe form in which the involutional symptoms colored or were superimposed on pre-existing severe personality deviations or definitely established abnormal mental states of psychogenic or organic origin, responded very slightly to their therapy.

A graphic representation of the results of therapy in the involutional psychoses is presented in Chart III.

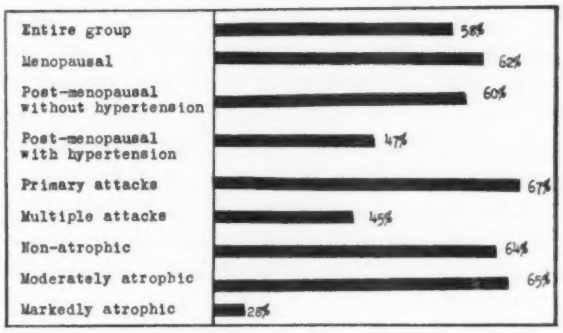

Chart III—Percentage of improvement in Involutional Psychoses associated with estrogen therapy (100 cases).

Manic Depressive Psychoses—A total of 40 cases diagnosed by the medical staff as manic depressive psychoses were treated. Every one of these cases had at least one previous episode, either of elation or depression and the clinical features were those more purely affective as distinguished from the delusional formation usually associated with involutional reactions. Thirty of the forty were depressed, five described as mixed, and five in a manic phase. Of the group, 18 were showing some menstrual irregularity, 2 definitely in the menopause itself, and 20 post-menopausal. Improvement of this post-menopausal group accompanied estrogenic therapy in 11 or 55 per cent of the cases. The whole group of 40 showed improvement sufficient to leave the hospital in 21 cases or 52 per cent. Figures as to prognosis in these psychoses are so difficult to evaluate that it seems unwise to try to draw any conclusions as to the effect of the medication.

Schizophrenia—The 30 schizophrenics who were treated showed improvement in only 40 per cent which falls well within the spontaneous recovery rate as reported by Malamud,[21] Rennie,[22] Osborne,[23] and others. There

were no recoveries. Results indicate that this group does not respond to estrogen replacement.

Other Psychoses—The 30 miscellaneous psychoses treated included those associated with alcohol, complicated by vascular or other somatic disease, and undiagnosed psychoses. These psychoses did not respond to estrogen therapy, there being no recoveries and 54 per cent remaining unimproved.

Indications for Therapy

A few general conclusions may be drawn from the above results as regards which group of women suffering from climacterial depression have the most favorable prognosis for estrogen therapy.

1) Involutional psychoses respond more favorably than other psychotic groups.

2) Psychoses not associated with vascular complications gave a greater response to estrogen therapy than those in which this factor was present.

3) Primary psychotic attacks gave evidence of greater response than recurring psychotic states.

4) The slightly subnormal and moderate atrophies evidenced in the diagnostic smears respond more favorably than the advanced atrophies.

Discussion

The high percentage of atrophic smears in the psychotic individuals when compared with the non-psychotics and the poor clinical response to estrogen therapy of the more advanced atrophies tends to point in the direction of an endocrine imbalance occurring in depressions of the climacterium. This imbalance when found in nature, both from endocrine and clinical observations, appears to lend itself to readjustment with estrogen therapy; when it has progressed to a severe state, both from the endocrine and mental standpoint, it is a more rigid condition and does not respond to estrogenic replacement. The co-existence of endocrine and mental imbalance with our present knowledge cannot be placed on an etiological relationship.

Summary

Detailed observations have been made on 600 women suffering from depressions of the climacterium and smear studies obtained. A greater atrophy was found in the psychotic than in the non-psychotic group. A correlation between the severity of the psychoses, the age, and the degree of abnormality reflected in the smear picture was found. The existence of an etiological relationship could not be ascertained.

Two hundred psychotic menopausal and post-menopausal women were treated with estrogen. Fifty-eight per cent of the involutional psychoses as contrasted with a maximum forty per cent expected showed improvement, and in some instances recovery, coincident with therapy; other psychotic states did not show any fundamental change. Estrogen therapy, therefore, controlled by the vaginal smear technique would seem to be justified as a method of treatment in the involutional psychoses.

References

1 Papanicolaou, G. N.: "The Sexual Cycle in the Human Female as Revealed by Vaginal Smears," *Am. J. Anat.*, 52: 519, 1933.
2 Papanicolaou, G. N.: "New Procedure for Staining Smears," *Science*, 95: 438, 1942.
3 Ripley, H. S., and Papanicolaou, G. N.: "The Menstrual Cycle With Vaginal Smear Studies in Schizophrenia, Depression, and Elation," *Am. J. Psychiat.*, 98: 567, 1942.
4 Shorr, E.: "The Menopause," *Bull. New York Acad. Med.*, 16: 453, 1940.
5 Stoddard, F. J., and Metzger, J. A.: "A Clinical Comparison of Three Commercial Estrogenic Preparations," *J. Clin. Endo.*, 2: 209, 1942.
6 Eisfelder, H. W.: "Clinical Evaluation of Estrone, Estradiol Benzoate and Diethylstilbesterol," *J. Clin. Endo.*, 2: 628, 1942.
7 Kurzrok, R.; Wilson, L., and Parloff, W. H.: "The Action of Diethylstilbesterol in Gynecological Dysfunctions," *Endocrinology*, 26: 581, 1940.
8 Salmon, U. J.; Geist, S. H., and Walter, R. I.: "Evaluation of Stilbesterol as a Therapeutic Estrogen," *Am. J. Obst. and Gynec.*, 40: 243, 1940.
9 Burlingame, C. C., and Patterson, M. B.: "Estrogen Therapy in the Psychoses," *J. Nerv. and Ment. Dis.*, 94: 265, 1941.
10 Hoch, A., and MacCurdy, J. T.: "Prognosis of Involutional Melancholia," *Arch. Neurol. and Psychiat.*, 7: 1, 1922.
11 Gillespie, R. D.: "The Clinical Differentiation of Types of Depression," *Guy's Hosp. Rep.*, 79: 306, 1929.
12 Henderson, D. K., and Gillespie, R. D.: *Textbook of Psychiatry*, 3rd edit., Oxford University Press, New York, 1933.
13 Strecker, E. A.: "Involutional Melancholia," *N. Y. State J. Med.*, 42: 530, 1942.
14 Titley, W. B.: "Pre-psychotic Personality of Patients With Agitated Depression," *Arch. Neurol. and Psychiat.*, 39: 333, 1938.
15 Palmer, H. D., and Sherman, S. H.: "The Involutional Melancholia Process," *Arch. Neurol. and Psychiat.*, 40: 762, 1938.
16 Chapman, E. A.: "Involutional Melancholia," *Elgin Papers*, 3: 171, 1939.
17 Strecker, E. A., and Ebaugh, F. G.: *Practical Clinical Psychiatry for Students and Practitioners*, Blakiston, Philadelphia, 1935.

18 Danziger, L.: "Estrogen Therapy of Agitated Depressions Associated With the Menopause," *Arch. Neurol. and Psychiat.*, 47: 305, 1942.
19 Brew, M. F., and Davidoff, E.: 'The Involutional Psychoses," *Psychiat. Quart.*, 14: 412, 1940.
20 Davidoff, E., and Goodstone, G. L.: "Use of Testosterone Propionate in Treatment of Involutional Psychoses in the Male," *Arch. Neurol. and Psychiat.*, 48: 811, 1942.
21 Malamud, W., and Render, N: "Course and Prognosis in Schizophrenia," *Am. J. Psychiat.*, 95: 1039, 1939.
22 Rennie, T. A. C.: "Follow-up Study of 500 Patients With Schizophrenia Admitted to Hospital from 1913 to 1923," *Arch. Neurol. and Psychiat.*, 42: 877, 1939.
23 Osborne, R. L.: "Prognosis in Schizophrenia," *J. A. M. A.*, 114: 846, 1940.

Past and Future Trends in Mental Disease*

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In this paper it is intended to summarize many of the trends in mental disease during the last World War period, during demobilization after the last World War, and during the depression years following the last World War. Facts will be pointed out concerning the present trend of mental disease and some conclusions drawn, and of necessity, some speculations made concerning future trends in mental disease.

World War, 1917-1918—Unusual emotional stresses were visited upon the population through the enlistment of men in the armed services. Later, illnesses, wounds and deaths among these men brought prolonged anxiety and grief to their families. Fully a quarter of the population was affected. War propaganda, general tension and maximum business activity subjected the entire population to new mental and physical strains. Admission rates for mental disorders were high during the war years, 83 per 100,000 of the population in 1917 and 82 in 1918, although those in Government service amounted to only five per cent of the population. Employment and wages were rising during these years.

Demobilization, 1919—The changed veteran returned to a changed world. After intense activity and continued emotionalism he found everyday life dull and humdrum. Frequently his job had been filled by another. Painful adjustment problems resulted, involving a large portion of the population. The general population, too, was finding post-war relaxation almost as trying as war-time tension. A rise in admission rates is observed from 82 in 1918 to 85 in 1919. Employment and wages were at a high level during 1919.

Economic Changes, 1921-1929—After 1920, employment began to fall off, with a momentary recovery in 1923. From 1923 to 1929 the increasing admission rates for mental disorders show a remarkable year-to-year agreement with the decreasing numbers employed. As employment decreases, the admission rates for mental disorders increase. The observed increases in mental disorders came *before* the depression, not during it. It should be noted that the increase in mental disorders are only a small fraction of the numbers represented in the decreases in employment.

The Depression—The severe conditions of this period, with many mental strains and physical deprivations, did not produce a proportionate rise in the admission rates for mental disorder. From 83 in 1929, the admission rate increased to 85 in 1930 and to a high for all the years of 86 in 1931. A drop to 85 occurs in 1932 and the same rate is held in 1933. The more substantial increases in admission rates had occurred between 1923 and 1929 when more than a hundred thousand workers were laid off. In the period following 1929 nearly twice as many additional workers were laid off, yet only a slight increase in new cases of mental disorder is observed.

The Factor of Relief—Between 1923 and 1929 the number employed decreased over one hundred thousand. During these same years the number of persons relieved by cities and towns increased about fifty thousand. The increase in relief fell short of meeting the needs arising through the loss of employment. During the same period the admission rates for mental disease increased from 76 in 1923 to 83 in 1929.

In the years 1929-1931, the number of workers employed continued to drop. How-

*Read at meeting of Texas Mental Hygiene Association, Houston, March, 1944.

ever, relief was more effective, increasing nearly 100 per cent between 1929 and 1931. During this period, mental disease showed a moderate increase from 83 in 1929 to 86 in 1931.

Between the years 1931 and 1933 the number employed dropped an additional twelve per cent, while the number of persons relieved by cities and towns increased one hundred per cent. For this period, the number of new placements on relief exceeded the numbers of new unemployed. Relief surpassed unemployment and was reaching back to take care of the unemployed of previous years. The admission rates dropped from 86 in 1931 to 85 in 1933.

Sex Differences—Six males with mental disorder are admitted for every five females. The male admission rates are higher than the female in every year of the period. In addition, the females have been improving their excellent position over the years. In the males the admission rates are higher at the end of the period than at the beginning. In the females the rates are actually lower in 1933 than in 1917. Both sexes did very well in the trying years of 1917-1933 but the females proved themselves to be hardier than the males.

Nativity and Mental Disorders

From an early policy of unrestricted immigration, the United States in 1891 began to enact legislation to check immigration, particularly of incompetents. These early laws had little effect, however, the 1917 law being the first to produce any noticeable change in existing conditions. The Quota Act of 1921 and later amendments checked immigration markedly so that the end of the period of our study, 1933, found immigration and emigration practically balanced.

The foreign born present the highest admission rates and the native born of foreign parentage reveal somewhat lower rates. The native born of mixed parentage show a still lower number and the native born of native parentage present the lowest level. The foreign born males show the highest admission rates of all nativity groups in six out of eight age classifications. In the females the foreign born are highest in all eight age groups. The native born of native parentage present the lowest admission rates in seven out of eight age groups in both males and females.

The males show higher admission rates than the females in all nativity groups. The native born with two foreign born parents present the greatest excess of males over females (28 per cent). These patients grew up in home situations which presented the maximum of conflict between the Old World customs of the two foreign born parents and the teachings offered the child by the New World. Such situations appear to be particularly trying to the male child. The native born of mixed parentage (one native and one foreign born parent) are lower, with an excess of males of twenty-one per cent. The native born with both parents native born are lowest with eleven per cent more male than female.

The foreign born show the smallest increase in admission rates in connection with advancing age. The native born of mixed parentage reveal the greatest tendency to higher admission rates in the older ages. Other nativity groups are intermediate.

Marriage and Mental Disorders

Married persons are the least susceptible to developing mental disorders. The widowed, the single and the divorced, in that order, show a higher incidence of mental ailments. Among women the admission rates for the widowed are 45 per cent higher than those of the married, the single 8 per cent higher and the divorced 230 per cent higher. The males demonstrate higher admission rates for mental disorders than the females in all these groups. The rate for the surviving male spouse is 130 per cent higher than the married, the single 200 per cent higher and the divorced 400 per cent higher.

The husband seems to be benefited to a greater extent than the wife by any adjustment or protective factor afforded by marriage. The single man shows 60 per cent more mental disorder than the single woman. If he enters marriage, he shows about the same amount of mental disease as the woman. However, if he leaves marriage, he shows about 35 or 40 per cent more mental disorder than the woman who leaves marriage. The marriage episode, reputedly incidental in the life of the man, has proved to be his saviour. The marriage, supposedly constituting the whole world for woman, has not carried the same

measure of protection. In reference to mental disease she benefited from the marriage in comparison with her sister who is single, but the gain is slight. The gain shown by the married man over the single man is tremendous.

Divorced males and widowers present more mental disease than divorced or widowed females. The males have shown a greater reaction to the loss of a wife, by divorce or death, than the woman to the loss of a husband. The dissolving of the unity of the home appears to be serious to both sexes but is more disastrous to the man than the woman. If a man marries, he will be a better prospect, as far as avoiding mental disease is concerned, than the single man. However, he must preserve his marriage or he may be in a worse position than the single man. Preservation of the marriage means less mental disease in the woman also, but the admission rates for the divorced or widowed are not so high relatively as they are in the case of the males.

Age in Mental Disorders

1) *Mental Disorder Is a Disease of Old Age.* Between 30 and 59 years the admission rates present moderate increases. Above 60 years they rise precipitously to the high point in the ages 80-89 years. The admission range of the 80-89 year group is nineteen times as high as that of the 10-19 year age group in males and eighteen times as high in females. Admission rates for mental disease and the population death rates are parallel in the various ages. This association tends to link the high incidence of mental disorders in the older ages with the years of failing physical resources.

2) *Males, Rather Than Females, Are the Unstable Sex.* On the whole, six psychotic males are admitted to mental hospitals for every five females. In all ages the males demonstrate higher admission rates than the females. The male admission rate is one-third higher than that of the females in the ages 20-29 years.

3) Changes in admission rates from year to year during the period 1917-1933 vary in accordance with age. The younger ages demonstrate *actual decreases in mental disorders despite war conditions, prohibition, unemployment, and a major depression.* Persons in the middle ages were not greatly affected by the stresses of this period and were able to hold their admission rates level. However, individuals in the ages over 50 did not adjust to the problems of 1917-1933, judging from the observed increases in mental disease.

4) The difference between the sexes is marked during the exacting years of 1917-1933. The women made more progress toward reductions in admission rates than the men, the women showing decreases in admission rates among the ages of 10 to 40 years, the men showing decreases between the ages of 10 and 30 years. Thus, the decreasing rates for the men end at the age of 30 years while the decreasing rates for the women continue for another ten years, until the age of 40. In the ages of 40-49 years the men demonstrate increasing rates while the females show a flat trend line. In the five decade age groups from 40 to 90 years the males meet the conditions of this period with increasing admission rates. From 40 years on, the females show increasing mental disorders in but two of the five age groups, 50-59 and 80-89 years. In the three groups 40-49, 60-69 and 70-79 years the females show neither increases nor decreases but maintain their mental disorders on the same general level. In the same ages the male reflects definite increases. Both the younger women (aged 10-39) and a portion of the older women (aged 60-79) weathered the many worries and deprivations of the period remarkably well, with decreases or flat trends in admission rates. Under the same conditions only the men under forty show either decreases or a flat trend.

The Influence of Physical Factors in Mental Disorders

It is interesting to compare the differing admission rates for mental diseases under and over the age of forty with the death rates for the same ages in the general population. Examination of the changes in causes of death of the general population during the past twenty or thirty years shows that progress has been made in overcoming certain diseases whereas little headway has been made against others. Diseases such as scarlet fever, diphtheria, measles, typhoid fever, diarrhea, enteritis, tuberculosis and pneumonia, which are more common in the younger ages, are apparently coming under control as they show definitely lower death rates than they did thirty years ago. These younger ages have decreasing ad-

mission rates in mental diseases also. Meanwhile such disorders as cancer, diabetes, diseases of the heart, diseases of the arteries, cerebral hemorrhage and nephritis, prevalent in the older age groups, have been showing definite increases. Increasing admission rates for mental diseases are found in these advanced ages also.

We have known for some time that the much-advertised increase in longevity has been accomplished through the saving of lives in infancy, early childhood and the first two or three decades. The expectation of life for a person fifty years of age or over is actually lower than it has been in the past. Little progress has been made in the control of organic and chronic diseases which are of serious import in the older ages. Lombard[1] presents the essential facts of the situation: "Two generations ago the average age at time of death of all individuals in Massachusetts was about thirty-one years. Today it is around fifty-four, a gain of some twenty years. In the same period the average age at time of death of individuals over fifty has decreased a fraction of a year . . . for individuals over fifty . . . the expectation of life has decreased."

With interest we note the association between a decreasing incidence of certain physical disorders in the younger ages and the decrease of mental disorders in the same ages. It is suggested that decreasing death rates for the physical diseases of the younger ages indicate that these disorders are leaving fewer of the more serious physical sequelae. Decreasing mortality may not necessarily mean a lesser morbidity but it does indicate fewer of the serious conditions that, in the past, have resulted in death. Milder forms of diseases of the younger ages leave a less damaged population. Is this young population, which is stronger and healthier than that of former years, more resistant to the stresses which make for the development of mental disorders?

We observe an increase in the degenerative diseases in the ages over fifty and a corresponding increase in mental diseases within the same ages. Are the basic factors in the causation of the degenerative diseases also common to the mental diseases of those ages? Do these serious disorders affecting the heart, the arteries and the kidneys, leave a badly damaged population which is more susceptible to the social, economic and personal stresses common in the development of mental disorders of the older ages? The study of a single psychosis can give us part of the answer. Cerebral arteriosclerosis has increased markedly in the general population over the past thirty years. The mental hospitals, in turn, have been admitting increasing numbers of the psychoses with cerebral arteriosclerosis.

While various physical conditions may thus appear in the role of causative factors in mental disorders, it is well to remember that other factors were responsible for the original physical breakdown. Insufficient food or poorly balanced diets, inadequate clothing, continued cold in poorly heated homes, long hours of work, heavy labor by persons not physically equipped for such exertion, loss of jobs, the deprivations of unemployment, marital difficulties, sex maladjustments, neglect of correctable physical defects, and non-treatment of various infectious conditions have depleted the bodies of men and women until they are old before their time. The marked increases in the so-called degenerative diseases are a warning. The present mode of living in the United States is not conducive to the health or longevity of persons over forty or fifty years of age. Persons who have gone through the premature wearing-out process of the ages under fifty years enter the older ages with distinct handicaps. Mental disorders find little resistance in these battle-scarred veterans of present-day society.

Clinical Diagnosis in Mental Disorders: Age Incidence

The findings suggest a new alignment of the relative importance of the psychoses. Dementia praecox and the manic depressive group, long regarded as the high incidence psychoses, are displaced by the mental disorders of age, the psychoses with cerebral arteriosclerosis and the senile psychoses. The psychoses of old age rise in gigantic proportions. Either the senile psychoses or the arteriosclerotic psychoses are showing a higher incidence than all other psychoses combined.

Consider for a moment this question of aging and the development of the psychoses of old age, senile psychoses and arteriosclerotic psychoses. Within the past decade the increase in the number of people past 65 was 35 per cent as against the general population in-

crease of only 7.2 per cent. The Bureau of Census reports that in 1940 there were approximately nine million persons over 65, a substantial segment of the population. During the fifty year period from 1930 to 1980 the number of people past 65 is expected to increase to twenty-two million. Mental disease associated with age presents a tremendous public health problem. The admission rate to mental hospitals of older people with mental diseases has rapidly increased. In 1922 admission rates to mental hospitals of persons suffering with diseases of the senium was 45 per 100,000 population while in 1939 it had rocketed to 70 per 100,000. The large number of schizophrenics and manic depressive psychoses have given up their numerical superiority to those suffering from senile psychoses and arteriosclerotic psychoses in our hospitals for mental disease.

It was once thought that definite pathological degenerative changes in the brain itself was the obvious cause of mental disease in older people. However, considerable proof is beginning to accumulate that this is not altogether the case and that psychological trauma, stress or strain, play an important part in producing mental diseases in the elderly just as it does in other age groups.

Winfred Overholser has written: "Psychiatrist and psychologists, like others working in the medical field, are sometimes prone to look too closely at the changes in the individual without considering adequately the impact of social forces upon him in molding his attitudes and feelings. This holds true in every field of human relations and startlingly so in the case of the older person. The tendency in America has been toward an undervaluation of old age, with the result that the aging person rather readily comes to look upon himself as being in the way, as being superannuated and no longer of any use to the community, or, indeed, as is all too often the case, even to his family. This tendency has been emphasized by the practice of industry, a practice which has at least until very recent times been gaining momentum, of forcing the retirement of employees at an early age, at even 40 or 45. Such an attitude is not only hard on the aging person, but illogical. Aging is a process which begins at birth, and progresses with varying rates of rapidity both as regards the individual and his several parts. Some persons are old at 45, others young at 70. Furthermore, one organ or organ-system may age prematurely (as the heart, arteries, or kidneys) whereas others maintain excellent function into much later years. Too much stress has been laid upon chronologic age, whereas physiologic and psychologic age are far more important.

"It has been reported that whereas in 1890 seventy-four per cent of the aged were employed, in 1930 this figure had fallen to fifty-eight per cent. Thus, in addition to the feeling of not being wanted, there is genuine ground for the development of anxieties regarding finances and future financial independence. This situation is further complicated by the attitude of many families and the feeling on the part of the younger generation that the "old folks" are hampering their activities and making themselves generally troublesome. Another factor which cannot be overlooked is the fact that the older a person becomes the more rapidly his friends seem to die about him, thus again emphasizing the feeling of loneliness. The change in housing conditions, with the tendency toward the occupancy of small apartments, is an additional factor in making dependence upon one's children distasteful and a source of anxiety to the aging person. It is also undoubtedly one reason why a staggering increase in admissions (over 500 per cent) to mental hospitals has occurred during the past quarter century in the groups diagnosed as psychosis with cerebral arteriosclerosis. The question may well be raised whether the tendency to expect the older person to retire into the background, not to occupy himself, in short, to 'protect' him, is not actually causing damage to his individuality. Perhaps we are overprotecting our old people just as many parents overprotect their children, often with tragic results in the warping of personalities."

It should be kept in mind, and this is highly important, that there are approximately ten to eleven million men and women in the Armed Forces at present, at approximately the opposite age group of adult population from the nine million people in the age group just discussed (those past 65). There have already been approximately one and a half million persons discharged from the Armed forces to the present time. Including both Army and Navy there have been approxi-

mately 650,000 discharged for medical reasons. A conservative estimate is that 33 per cent, or one-third, of those medical discharges, or approximately 200,000, persons have been discharged for neuropsychiatric, nervous or mental conditions.

It is estimated that after this war there will be approximately fifteen million veterans including veterans of World War I, who by the way are dying on the average of 110 daily. No one knows just what the incidence of neuropsychiatric conditions will actually be in this huge army of fifteen million veterans returned to civilian status, but if present trends continue even in those discharged before the war ends, there will be a tremendous number of neuropsychiatric cases. In the past only 50 to 60 per cent of people disabled or suffering from neuropsychiatric conditions were hospitalized in mental institutions. However, return of the nervous and mental casualties with the oftentimes devastating influence upon their own family ties as far as the development of civilian psychiatric casualties are concerned represents a tremendous problem in our communities.

A large percentage of selectees are being rejected at the induction center. The newspapers carry the report that three to four out of ten are being rejected. The greatest number of rejections are for neuropsychiatric, nervous and mental conditions, which certainly should cause all of us to pause to consider why this should be so.

Conclusion

Although this paper may raise more questions than it answers, it is of prime importance in that it calls attention to what is happening to us. Not only what is happening to our older population, but what is happening to our adult population at the opposite end of the age group as represented by men of military age, seventeen to thirty-eight.

Must we find in modern civilization instead of the rewards of a well spent life that the price to pay for living past fifty or sixty is the high probability of developing a mental disease and spending our declining years in an institution? Must it be said, too, that the price that our youth must pay for living in our present civilization is the risk of developing a disabling neuropsychiatric condition? Whatever the answer may be, there is one certainty. These conditions offer a challenge to all of us, the solution of which will demand the best in intelligence, energy, devotion, and persistence from clinicians, research workers, social service workers, administrators, clergy, educators and from all community minded and community conscious persons. To him who asserts that all frontiers in this country are conquered, I leave this challenge.

Author's Note: Acknowledgment is made to Neil A., Dayton, from whose book, "New Facts on Mental Disorders," a statistical survey of 89,190 cases of mental disease in Massachusetts, I have obtained much material and also to the conference held in Washington, D. C., in May, 1941, on "Mental Health in Later Maturity."

References

1 Lombard,
2 Overholser, Winfred: "Orientation and Mental Health in Later Maturity," Federal Security Agency, United States Public Health Service, Supplement No. 168.

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Therapeutic Potentialities in Psychiatric Disorders*

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In the not distant past when the classification system of Kraepelin was the accepted theory, it was sufficient merely to discover certain so-called symptoms to place the indelible stamp of dementia praecox on a patient. The prognosis of schizophrenia was so doubtful and pessimistic that such a prognosis practically sealed the fate of the patient.

But the measure of progress in psychiatry is evidenced in the fact that distinctions are made and differences seen among schizophrenias. The conception of dementia praecox as a single clinical entity becomes outgrown and a separation into two main categories is attempted: (a) the reactive schizophrenia, or schizophrenic-like psychoses, and (b) "true" schizophrenia, or the process type.

According to Langfeldt[1] the reactive type of schizophrenia is characterized by: (1) acute onset; (2) a period of cloudiness; (3) definite evidence in the life history of exogenous factors. The process type, conversely, is characterized by: (1) a gradual onset; (2) no period of cloudiness, and (3) absence of exogenous factors. If, then, we accept Strecker's[2] estimate, that of the 75,000 annual new admissions to state hospitals 25 per cent are reactive psychoses, an important field for efficacious treatment lies ahead of us.

At present much reliance is placed on shock therapy and large numbers of patients are discharged as cured after shock treatments. These figures have, however, undergone a fairly steady revision downward. Concerning the role of the shock therapies Langfeldt commented:

"We are here dealing with an extremely important group of mental disorders which at a number of clinics quite clearly form just the material which has proved most adaptable to shock treatment. The personal experience of the author is the same as that of others (Jakobowsky, Kogles, Kuppers, Rian) that it is correct that it is these—schizophrenia-like conditions with cloudiness and incoherence, acute onset and exogenically demonstrable factors which react favorably, particularly to cardiazol treatment. But in contrast to a number of other authors the author is of the opinion that these states have no connection with schizophrenia. They are quite simply exogenic reaction forms, which presumably, owing to individual factors, assume schizophrenic-like appearance. . . . After treatment for a short or longer period these cases remitted (this they do also without treatment) . . ."

Such so-called reactive schizophrenic states may remit or apparently remit spontaneously. A scientific attitude even in these instances of spontaneous recovery and improvement would dictate the query, "Why?" Possible answers to the question present themselves. (a) Removal of the patient to a neutral environment in the hospital away from the centers of conflict affords the patient a respite. Massermann[3] experimenting with laboratory animals demonstrated that a cat, conditioned to take food from a conveyor on a signal light, will resist being taken out of the feeding cage. However, when a conflicting situation has been introduced, blowing a blast of air at the cat on food-taking, and the cat has been rendered "neurotic" as a consequence, it will resist being put into the cage, and when forced in, will make every effort to escape the locus of the conflict. (b) The patient may "work through" some of his conflict. (c) The situation precipitating the conflict may change. (d) The threat of the punitive character of the shock therapies may mobilize enough psychic energy to produce more adjustive behavior. Much is made of the fact that electric shock therapy is not feared by the patients. To be accurate it should be stated that they fear it less than metrazol treatments, but fear it they do. (e) Perhaps a factor too often lightly regarded in the mental institution is the interest and rapport established between physician and patient and between other members of the hospital personnel and patient. Such relationships may be haphazard and poorly directed, but undoubtedly not infrequently effective. In Massermann's experiments it was shown that if the "neurotic" cat which refused to take food (despite starvation

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for several days) is encouraged and petted by the experimenter whom it likes and trusts, it may break through its conflict, overcome its phobia and partake of the food in spite of the conflict-precipitating air blast. Placing a "normal" cat into the cage of the "neurotic" cat causes a change in attitude. The example of the normal feeding fearlessly may finally induce the "neurotic" cat to break through its inhibitions.

In many instances the patient has a discoverable problem which he can be helped to solve. Take for example the following:

Case 1—E. M., a white male, age 20. Delivered by Caesarian section. Was a feeding problem until 9 months of age when he began taking solid food. Parents lived together only 2½ years and were divorced. His early history throughout was marked by behavioral difficulties. He was a poor student and lacked persistence, although the psychometric examination gave him an I. Q. of 116. He was continually reported for misconduct by his teachers. At 13 he was placed in a juvenile detention home when discovered in sex play with a group of boys. Shortly after that he ran away from the home and was returned by the police. At 17 he ran away again and stayed away for six or eight months. He kept late hours, drank heavily. It is interesting to note that in giving the history of her son the mother recounted that when patient was 3 years old he stole 15 cents which his grandmother had put out for the iceman. In January, 1941, he suffered a gastric hemorrhage, apparently as a result of heavy drinking and it was discovered he had peptic ulcers. When he learned his mother was planning to send him to a convalescent home he attempted suicide by taking 10 phenobarbital tablets and consequently was rushed to the county hospital. There he was resuscitated and subsequently received 31 electric shock treatments, apparently without beneficial results, and then was admitted to the Chicago State Hospital August 21, 1942. Here he was resistive, withdrawn, having auditory hallucinations.

He was placed on insulin therapy, but shortly afterwards because he complained of hematemesis and alluded to his history of gastric ulcer (not confirmed by x-ray) he was given small doses of insulin and never experienced a coma.

He was found to be a difficult behavior problem on treatment. His conduct was definitely provocative and when called to account he would adopt a hang-dog attitude. "Sure, I'm always wrong," he would remark. In group psychotherapy class, although there was much to indicate that the material was registering forcibly, his provocative and testing-out behavior continued. Resistance to therapeutic influence was shown by the numerous questions he would ask in class, these being designed to catch therapist in a palpable absurdity or contradiction.

After therapist had become better acquainted with his personality make-up (and had become better acquainted with his mother, too) upon the occasion of one of his provocative misdemeanors therapist remarked to him: "You think people are always against you, don't you?" His answer, vague and evasive though it was, indicated that patient had been startled by therapist's question and the ensuing pause substantially corroborated it. The doctor pointed out that although people generally will not go out of their way to help him, they are not necessarily against him. That though his mother was displaying animosity toward him, a fact responsible for his provocative behavior toward her, it was patently harmful and inimical to his own interests to direct the same behavior toward the therapist, who represented a parent-substitute in his mind. Here the patient was quick to protest that he did not hate his mother. Therapist agreed, and reminded patient that he had observed the patient when the attendant announced that his mother had come to visit. The patient's face had lighted up like a beacon, proof enough of his feeling for his mother. But strange as it may seem, he also hated her in a way which was the mirror-image of his mother's feelings toward him. His behavior therefore was designed, unconsciously, to make her pay attention to him, often punitive and unwelcome attention, to be sure, but attention nevertheless. Such attention-getting devices, for example, were getting drunk and getting into a variety of scrapes. At the same time these very scrapes he gets into are a means of wreaking vengeance on her. Having done this he unconsciously begins to feel a sense of guilt, for which reason he will inflict some kind of punishment—his provocative behavior. Now having been punished and having expiated, the decks are clear to start the cycle

over again. This, the therapist, contends, is poor adjustment and is like cutting off his own nose to spite his mother. He nods in essential agreement with the above exposition and says: "There's a lot in what you say, doctor."

Eloquent testimony to the correctness of this interpretation was supplied by the marked change in patient's subsequent behavior. He became cooperative and helpful on the ward without a hint of provocativeness. Moreover, there was not the slightest evidence of that cloying oversolicitousness of the psychotic who has made a positive transference. He was unobtrusive but ready and willing to comply with any reasonable suggestion. He was entirely satisfactory.

There was now, a few weeks after commencement of treatment, no discernible evidence of a psychosis. The possibility of parole was suggested to his mother. To this the mother responded with vehement protest. "You know, doctor, he'll never be any good," not infrequently in the presence of the patient. This statement she had often made to attendants, also within hearing of the patient. Finally, by dint of persuasion by the doctor and patient, she was induced to take the patient out on parole.

The patient obtained a job readily enough but arguments recurred between him and his mother. He quit one job and was discharged from several others in rapid succession. In interviews circumstances leading up to his resignation and dismissals were gone into, and it was evident that he adopted much the same behavior toward foremen as he had at first exhibited at the institution. In the home environment once more, his mother's aggressions had brought about a return of his former conduct. At one time the patient brought with him a circular from the Federal Government advertising for workers to take a brief course for some kind of chemical work. This, he hoped, was the short cut to the profession of chemistry which had been his ambition. It was therapist's belief, however, that this would lead only to routine chemical testing, and would not make a chemist of him. He replied that he had often thought he would make a brilliant discovery. The doctor now tried to demonstrate the meaning of short cuts for him. He wished to dazzle his mother; that was why the other jobs were not kept—because promotion was too slow for him. It was explained that he must do things primarily because they were for his own good, and not because of their effect on his mother.

Patient even before he left the hospital had expressed the ambition to be a chemist. He had finished only 1½ years in high school, and determined to complete the course in night high school. After a few nights at school, immediately after leaving the hospital, he had quit, claiming that day work in conjunction with night school was too hard for him. It was now pointed out again that although he was only twenty and had plenty of time, the prospect of so many years of study was too slow for him, because of his emotional need to impress his mother quickly.

There were now increasingly more frequent quarrels with his mother, largely because the latter wished to have the boy returned to the hospital before the expiration of the parole period. His mother began to berate the therapist over the telephone for encouraging the boy in his poor behavior. Quarrels between mother and son often began under circumstances which demonstrated her ambivalence toward her son. For example, at one time the patient encountered his mother at his girl friend's house where the mother had been telling the girl that patient would never be any good; would never earn a living and would never support a wife. She warned the girl to have nothing to do with her son. That the mother was identifying the son with her ex-husband was obvious.

Upon another occasion near the expiration of his second parole period the mother called therapist. She was resentful against therapist and hospital for failure to assume responsibility for the patient. "That's no way to do," she upbraided, "I won't be responsible for his actions," etc., etc. She complained that the boy won't work; that he quits or is fired from every job, and then sponges on her. The patient is too attracted to a certain girl friend; he takes too much interest in her. She pitied the girl. What kind of a husband would he make? She expressed her fears of what may happen, hinting darkly but broadly at the possibility of sexual relations and possible illegitimate pregnancy. She would not be responsible for this. The hospital and therapist would rightly be responsible for such an occurrence, because from all this it was plain to

anybody that the boy was not in his right mind. The hospital and doctors should not encourage him but should take a hand. "Some time ago," the mother continued, "the boy had spent a week-end at this girl's summer cottage," and she, the mother, had been in a state of great anxiety as to what might happen. As a matter of fact, the patient had telephoned to ask if it would be permissible for him to spend a week-end at this summer cottage. Asked who would be there, he stated that the girl's family would be present. Writer could see no objection. Apparently this had been a point of dispute between mother and son, and the patient had obviously used doctor's approval as a major argument. Therapist now points out to the mother that nothing did happen. Mother went on to complain he had taken ten dollars and carfare to register at an employment agency, but that he had spent this money on his girl. There was no other solution but that the hospital take a hand and have him recommitted.

A few minutes later the patient called. He was present at his mother's conversation and as she had just stepped out of the house he attempted a rebuttal. He did borrow the money from his mother, but did not spend it on the girl as alleged. He had paid it to an agency and even now was expecting to get a job. He was looking for work every day. He inquired whether he could leave home, although he was still on parole. He wanted to leave immediately. Therapist replied that he had often wished to suggest this very thing; that living away from his mother might help, but that he wondered whether patient could stay away from home without getting into serious trouble. The boy protested that he had stayed away from home almost a year on a previous occasion and had gotten along well enough, but every time he leaves home she has him brought back by the police. He then voiced his desire again to leave home and wanted to know if this would jeopardize his parole standing and if it would not enable his mother to recommit him. To this question the therapist was forced to reply in the affirmative, but he pointed out to patient how this problem would have been greatly simplified if he were working steadily; in that case the mother could find little reason to recommit him or revoke his parole again.

In a few days the boy telephoned to let us know that he had obtained a satisfactory position and shortly after this to advise that he had been called by his draft board.

After three or four weeks therapist received a letter from patient from one of the army flying fields. He was in the army, apparently one of the ground crew, and getting along well. He sent a number of other letters during the following weeks, none of them suggesting the least evidence of mental disorder. After six months service he obtained a furlough and visited therapist looking as fit as a fiddle. He had earned a marksmanship medal. Not a sign of mental or behavior disorder. Latest word from him announced that he was promoted to corporal.

Separated from his mother and in the army, his mother could not display the negative component of her ambivalence. The patient understands his mother better and is sorry for her. He realizes she is a maladjusted, unhappy woman who had identified him unconsciously with his father. He has achieved greater emotional maturity. Without therapy the patient might not have adjusted to military life, since, as with his jobs, he would have acted provocatively with superiors as parent-substitutes.

Therapist was curious to know how the patient had gotten into the army. He explained that when seen by the induction board psychiatrist the latter had neglected to ask him about any previous mental breakdowns or hospitalizations, and as patient wanted to get into the army he had not volunteered the information.

In all this categorizing of process and reactive forms of psychosis there is the prevailing human fallacious, bidimensional, or dichotonous thinking. Nature herself knows no such sharp separations. On the contrary, these concepts must be considered as denoting a range or spectrum. In other words, we may believe that in any patient there will be an admixture of the schizophrenic processes. The implication of therapeutic helplessness in the presence of the process type of schizophrenia is considerably exaggerated. We must estimate "how much" and assay prognosis accordingly. Galt[4] has aptly phrased this tendency to dualism: "With the advance of scientific knowledge many man-made dichotomies have fallen by the wayside. These include the duality between vitalism and mecha-

nism, between structure and funtion, between organism and environment, between body and mind. Modern science discloses that the principle of duality does not exist even in such long and seemingly fundamental bidimensionalities as plant versus animal, and living versus non-living forms."

In the following case, because of the duration of the disease, its course and manifestations, there is good reason to believe that a so-called "true" schizophrenia exists and in which the "process" element is also potent. Yet under continuous therapy this patient manages to make satisfactory extramural adjustment.

Case 2—J. S., a 23-year-old white male. Father born in Lithuania, studied for the rabbinate, but came to the United States at the age of 17 and became a mechanic. Traveled around the country on a motorcycle, but settled down in Chicago in 1914, was married and opened an auto radiator repair shop which prospered. Came the depression and reduction in the volume of his business. Though warned by his attorney to retrench he increased his advertising expenditures. Finances deteriorated rapidly. He lost much of his property. At this juncture patient's father began to write and have printed pamphlets with such titles as "Democracy," "Eugenics," "The New Democracy." The patient, about 9 years old, would help his father sell these pamphlets. The father now developed ideas about his being defrauded of his property. Started suit against Standard Oil Co. for opening a gas station across the street from his shop. While he was being evicted he refused the offer of temporary shelter and assistance, saying he was capable of earning millions, was the inventor of a number of well-known patents. Patient's father finally committed to state hospital with diagnosis of dementia praecox, paranoid type. Patient's mother, also, has had a period of hospitalization in a mental institution.

Patient and 8 siblings were cared for in different homes. Three years prior to admission it was noticed that patient's behavior was peculiar. He jumped from his bed one night, laughed hysterically and acted silly. Even before this episode, four years antedating it, a psychiatrist's report (1934) was even more revealing; to quote: "We do not feel that this boy will make an outstanding achievement, but we think he will make a better than average place for himself. During the past year in particular the boy seems to show evidence of following the same paranoid pattern of his father." This psychiatrist recommended that "J—— be handled carefully to avoid the precipitation of a breakdown."

Following a period of persistent doorbell-ringing he was committed to the Chicago State Hospital. At the hospital he was found delusional, levelled-off; had grotesque manneriisms and grimaces. Shortly after admission he told the doctor that he felt obligated to take his father's place and look out for the family.

He was placed on insulin therapy from May 13, 1941, to August 1, 1941, with a social recovery. Paroled to his sister and brother-in-law.

In the subsequent interviews it developed he had formed a very strong identification with his father. He stated he had thought his father was a "great fellow." At another time he stated his father was his idol, and recalled how the father had taken the children to shows and how as a hobby he often cooked for the family. He was very companionable with his children; they frequently went on outings. Then, when patient was about 9 years old this happy life suddenly exploded in his face. At the time, he stated, he couldn't understand it. "I used to think that what happened to him could happen to me. That's why I leaned to the study of social problems." He had expected to go into law and some day vindicate his father. His foster-father, a kindly elderly retired man, had been a member of the Socialist party and finally got patient interested in socialism. Now, the patient related, he thought he understood how his father had been defrauded. He wrote about these ideas to his father and received a stinging reply, that he (his father) was not a Socialist, and the very hint of it was repugnant to him. He was outraged that his son should have taken up such an obnoxious creed. No, he was not a victim of the class struggle, and his financial difficulties could not be laid to the capitalist system in which the father was an ardent believer. The reply was a shock to the patient, who related how he had kept his father's letters over a period of 4 years neatly tied up in his dresser drawer and would peruse them frequently. Then, in a fit of

despondency, he concluded he had done all he could for his father and threw the letters away. He later suffered from remorse and guilt for this act.

Two or three weeks after his release from the hospital he came for an interview acting in the silliest fashion. His clothes were crumpled. He had a number of unusual-looking thin stogies with numerous cords in them protruding from his breast pocket. He laughed and grimaced in the most bizarre manner. He kept puffing industriously on one of the stogies, spilling cigar ashes over his clothes. When asked about this he explained that he had bought the stogies in a Mexican store. With him he had some handbill in Spanish announcing a Mexican mass meeting and entertainment. He was going to attend this meeting, explaining that he desired to associate with Mexicans because Mexicans "are lower than me. Contrasted with them I seem higher." It all appeared hopeless; the sister was advised to return him to the hospital. However, she desired to wait and see what would happen, and the patient continued to come for his weekly interviews.

Soon the patient's disturbed behavior subsided. In subsequent interviews he achieved a measure of relief and improved. He was now working in the stock yards on a late shift, and went back to college, of which he had completed about a year. His adjustment continued good and he passed all his subjects the first semester. In the second semester he had difficulty with chemistry and at this writing is making it up in summer school. He works hard, studies hard, lives by himself, and occasionally suffers from a more or less acute depression that results from a pessimistic appraisal of his situation. At such times he will unburden himself to the therapist about the monotony of his existence and its uselessness. Therapist often goes over the situation with him and reassures him. He has a girl friend, occasionally goes out, but is inclined to feel ill-at-ease in company. He wants very much to stay well. Whenever intrapsychic tension begins to mount in him it can be recognized the moment he steps through the door. The facial muscles become taut and there is a suggestion of a return of the grimacing.

He has been out of the institution for about 2 years, but prognosis must remain guarded. There appears to be a "process" component in his personality make-up.

The patient, under treatment, achieved a measure of emotional catharsis. His ego is weak, however, as evidenced by the numerous identifications he makes with his father and father-substitutes. He now has considerable insight into his condition but the process element in his personality may always be discovered in the background, threatening to close in.

Obviously this patient leans heavily on the therapist, who, no doubt, also represents a father-substitute in patient's mind. The possibility of a break in this relationship has occurred to him, as on one occasion during an interview he asks therapist: "Doctor, why are you doing this for me?" He had to be reassured on this point. The effect of a rupture in this relationship is not difficult to predict.

But it may be hoped that with more and more experience of achievement and acceptance, the sense of success and power thus derived may come to overlay the deeper memories of his early thwartings; that he may achieve sufficient self-assurance to enable him to remain adjusted under ordinary circumstances so that therapist's support can be gradually withdrawn.

As a relatively new branch of medicine, psychiatry suffers from a tendency to think in the dualism represented by the terms "cure" and "failure"—bidimensional black-and-white. In the presence of this malignant process which has gone unopposed for years we must consider the possibility that the damage may be permanent and the "cure" somewhat like restoring an amputated member or appendage. We may hope to supply some of the deficient function, but cannot restore the lost member. It is in nowise different from the treatment of a cardiac valvular lesion. The doctor does not attempt to "cure" the patient, but to keep him compensated. We believe this a worthwhile achievement. This appears to be essentially the case with the so-called more or less deteriorated psychiatric patient.

Notwithstanding the distinction between endogenous and exogenous, process and reactive types of schizophrenia, untreated and left to his own devices the more favorable or "reactive" schizophrenic may regress and in the long run will be indistinguishable from the "true" schizophrenic.

Extreme pessimism with regard to the form of mental disorders known as paranoid psychoses may itself be founded on false interpretation. Traditionally the paranoid mental state has been supposed to be founded on a "psychopathic predisposition made up of constitutional defect by reason of bad heredity."

It is likely such concepts merely cover up our essential ignorance, and belong in the category of outgrown generalizations. N. Cameron[5] believes: "During childhood the effect of adult displeasure, rebuff and ridicule greatly reduces social interchange on forbidden topics and so drives them from the public social field of talk largely into the restricted personal field of thinking where they can have only a very limited social validity." A. Paranoiac[6] states: "It is presented (paranoid thinking) as founded on a misinterpretation of the significance of fact, for the correct interpretation of which the previous experience and education have been inadequate, and for the timely correction of which he has not been fortunate enough to have obtained the necessary assistance. It is presented as having begun at any time during life—at an early age or later; and as developing into a delusional system through misinterpretation of the significance of other facts seen in the light of the original misinterpretation, and through misinterpretation of still more facts seen in the light of all the misinterpretations that have preceded; and so on, and so on, each one in turn supported more strongly than the last, with conceit and suspicion or their opposites arising and increasing as a result of social disapproval—not at all as a result of any innate morbidity."

Gralnik[7] in his report of the Carrington Family gives interesting examples of the origin of paranoid thinking.

In the following case report the origin of paranoid thinking is pointedly demonstrated:

Case 3—J. B. Admitted to Chicago State Hospital in March, 1942. Classified schizophrenia, undetermined type. Age 35.

Little information could be obtained about the early history of patient. He was a normal delivery. Patient graduated from high school, a satisfactory student but not outstanding. While in high school patient was on the swimming team and in the radio club, otherwise was not especially interested in school activities.

Some time after graduation from high school patient took up a course in barbering. He worked at this trade for some time, but derived little income from it. In April, 1941, he went to work in a steel mill until his hospitalization.

The patient is single, having little interest in girls. He had a few dates, but was never known to comment on the subject nor did he accept teasing on this point in good grace. People outside the family circle thought him shy and retiring but were attracted to him.

He had been drinking moderately for the past ten years, but recently the habit had gradually grown excessive. However, he had limited his drinking mostly to week-ends, so that he lost no time from work. In the 2 or 3 weeks prior to commitment he had drunk heavily. Under the influence of liquor he becomes cross, irritable and domineering—the latter significant in the light of patient's later disclosures.

It was stated that he had always been irritable at home; outspoken in his antagonisms.

The onset of his psychosis was said to date from the receipt of his draft notice about 2 months prior to his admission to the hospital. He became more "nervous" and began taking sedatives. On receipt of a second notice the patient began expressing paranoid ideas, stating there were spies out watching him. He would sit and stare out of the window in a dreamy state. Several times he asked some members of the family if they heard the voices too and seemed confused when the answer was in the negative.

He was induced to enter a hospital where hyperthyroidism was suspected. While B. M. R. was being done, to quote verbatim from the hospital's report: "all of a sudden he became irrational, uncontrollable, showing signs of derangement. This hospital being general and not equipped for mental cases, he was sent to psychopathic for a more thorough study." He consented to enter Elgin State Hospital as a voluntary patient, but became homesick and quickly left.

At Chicago State Hospital he was given 5 electric shock convulsions and when he complained of pain in the back, x-ray was ordered which showed pathology in the dorsal spine. Therefore, on June 2, 1942, he was placed on insulin therapy. His adjustment at this time was excellent. He became interested in cur-

rent affairs, sociable and talkative. This was especially marked in group psychotherapy class where he was the leader in class work, invariably giving intelligent and well-informed discussions, achieving a state of excellent rapport with therapist.

Insulin therapy was terminated September 4, 1942, with a social recovery. Paroled to his father September 18, 1942.

He sought out examiner of his own accord and came for an interview on October 25 because of some vague somatic complaints. During the interview he revealed that his paranoid ideation was again coming to the fore. He felt that his foreman had his eye on him and he was thought to be a Nazi spy. Fellows would scatter when he came up to a group of them. One of the reasons according to his explanation was:

"Some years ago I had an idea of writing a play against war. One of the characters in it was to be insane." He recited a poem which was to have been included in the play. He stated: "It was all foolish. I couldn't understand it. Toward the end I wanted to get into the army. I thought I would escape my troubles and the fellows who were following me. But when I went up for my examination I got lost and seemed I was supposed to meet a fellow."

At a later interview he gave an account of this episode. While he was at the induction board, somebody, he says, directed him to go somewhere to meet a certain fellow. He walked out, took a street car and rode about 3 miles. He got off the street car, went into a store and asked for this fellow. They knew nothing about him. Then he waited on the corner for about half an hour, and suddenly, it seems, he became aware of the fact that he should be back at the induction board. He took a street car back, walking in foolishly and apprehensively, believing it was all a trick and that he had been hypnotized. It is quite possible that the patient during this conflictful episode, experienced a fugue-like state.

At another interview he stated, "I wanted to go to college, but my mother's idea was for me to become a barber. I didn't like barbering. I wanted to be an aviator, then a dentist—mother discouraged me. She'd say: 'You're not smart enough.' I got the idea she held me back. I became a barber, however, and I wanted to get my own shop, but I didn't have money. I didn't like people. Finally I got a job; it was hard work, but for the first time I was happy. It seemed I was now supporting myself and not dependent on my folks."

At a subsequent interview he stated he was feeling well, but he noticed when he gets out into society he gets inexplicable fears. He says: "I was on a street car and an idea came into my mind, and I got scared." Asked for his associations, he says the idea that scared him was the word "clap." "It always flashes into my mind. It's silly." The word "clap" reminded him of a redhead. He states she was a mysterious girl. She seemed to be afraid of something—like himself. Several times she made remarks about hoodlums. "I never could figure her out. I went with her several years. I liked her, but wasn't in love with her. She was so secretive. She wanted to get married, but I couldn't quite decide." Obviously the patient was attributing to the girl the suspiciousness and secretiveness he himself felt toward others.

Later in speaking of his mother he remarks: "When I was laid off from work my mother decided I should take up barbering, but when I began working at it I couldn't make enough. I made about 8 or 9 dollars a week and worked long hours. I thought maybe I could get my own shop and my mother would help me, but she wouldn't. She used to say I was too dumb; I couldn't do anything and I'd lose the money. My mother was strange; we were opposites." He explained that his parents were immigrants, and his mother has the typical peasant outlook. Although ambitious, she thinks the only way to get ahead is by hard, physical work. She herself has always worked hard, been thrifty and domineering. "I used to like to read books. She used to say: 'Throw that away.' My mother was always the boss, my father was always the quiet one. Sometimes she'd make unflattering comparisons. She'd say: 'Look at that fellow; he's getting somewhere. You're dumb.' Once in a while she'd have some kind of tantrum and talk all day about everything that happened since her marriage. My mother was the whole boss. I felt she was trying to hold me down. I began to hate her for it."

(If so significant a person as one's own mother is hostile and a sinister threat, what can the individual expect from others? If one's outlook is thus colored, paranoid pro-

jections concerning other less significant persons are an almost foregone conclusion.)

At a later interview when asked about the people who were watching him, he replied: "Oh, they don't bother me any more." Later in the interview he remarked: "When I had a cold I felt pretty blue. That made me disgusted. In the shop at work we get sweated up and then you go out in the cold. I tell you my wrist got stiff and then my neck and then my jaw got stiff when I yawned. I read in the paper that frequently before a nervous breakdown the neck gets stiff and it started me wondering. That just made me think of that readhead (laughs). I must have liked her but I thought she was immoral and I couldn't decide about her. I remember once the year before I got sick, she wanted to get married, and I couldn't make up my mind. I was just all mixed up."

Q. Whom does she remind you of?

A. My mother. The way mother made me feel if I got married and she'd be on my neck (is this, perchance, the meaning of the pain and stiffness in his neck?). The way mother did it wasn't worth it. Sometimes when I'd be sitting home thinking about marriage I'd think of my mother, and then I'd feel it wouldn't pay me. My mother—I didn't like her, but I didn't want to show it. She was always tight, parsimonious, frugal—tight. I remember one time when my father was sick she would beef about it. He wasn't working. She was always saving, ambitious to get ahead. She was left an orphan when she was a little girl and her stepmother didn't treat her kindly. She had to work hard. I think that's why she got the instinct to save.

Q. Is your mother responsible for the pain in your neck?

A. Looks strange, I thought.

Q. By any chance couldn't we think of it this way: your mother is responsible for the necessity of your working in the factory, and thus you develop these pains in your neck.

A. Well, before I came to the hospital when I worked in the factory I'd feel all right, but often after work I'd go to the tavern and get drunk and sit there and brood and get depressed.

Q. Well, can we look at it this way? You felt that your mother was responsible for your having to work in the factory, because she had shattered your other ambitions. But during the day as you were working it didn't seem so bad. The work didn't actually seem so dreadful. You were getting to tolerate it quite well. You weren't so badly dissatisfied with it, so afterwards you had to go and drink in order to feel properly resentful against your mother again."

The patient looked around, bewildered, then burst out laughing self-consciously.

"Well, maybe that was it," he acknowledged shamefacedly.

He had apparently relinquished his paranoid ideas by this time. He made no further somatic complaints. When last seen he was working steadily and getting along well.

Whether the patient is "cured" is open to question. But it would seem that under treatment some of his fundamental misinterpretations received scrutiny and were consequently revised, with at least some amelioration in his tendency toward paranoid projections.

Summary and Conclusions

The tendency to think of "true" schizophrenia and "schizophrenic-like" reactions, or "process" and "reactive" schizophrenia has little basis in fact. The reactive schizophrenic, unfortunate enough to be continually thwarted and traumatized, may regress still further and become fixed in his regressive characteristics. Conversely, the so-called "true" or "process" schizophrenic, sufficiently protected who makes a good transference with therapist and whose psychic energies are thus conserved and husbanded, may suffer relatively little perceptible regression. No absolute distinction is possible; the patient is but the resultant of reaction of the conflicting forces he embodies. In the long run the end-product of the "reactive" schizophrenic is indistinguishable from that of the "true" schizophrenic. Results are determined by the "adjustment of internal relations to external relations."

Because the paranoid psychoses have not yielded to superficial persuasion, a degree of fatalism and a conviction of "constitutional and hereditary predisposition" have become firmly intrenched. But whatever an hereditary or constitutional predisposition may be there is some reason to believe that in many of these paranoid patients it would nevertheless not have culminated in paranoid psychoses were there not some serious, long-

continued disorder in their (especially early) interpersonal relationships. Out of the latter arises the primary misinterpretation in the light of which other facts are further misinterpreted. With a reexamination of the primary misinterpretations the result may be a loosening of the whole delusional, projective structure, with consequent benefit to the patient. The psychiatrist may hope to be effective insofar as he can manipulate these forces in the patient's ultimate best interests.

References

1 Langfeldt, Gabriel: *The Schizophreniform States*, Monograph.
2 Strecker, E. A.: *Fundamentals of Psychiatry*, Lippincott.
3 Massermann, J.: *Behavior and Neurosis*, University of Chicago Press.
4 Galt, Wm. E.: "Male-Female Dichotomy in Human Behavior," *Psychiatry* (White Foundation), Feb., 1943.
5 Cameron, N.: "Development of Paranoid Thinking," *Psychological Review*, March, 1943.
6 "Paranoiac, A.": "Paranoia from the Subjective Point of View," *Psychoanalytic Review*, Vol. viii, 1926.
7 Gralnick: "The Carrington Family: A Psychiatric and Social Study, Illustrating the Psychosis of Association or Folie a Deux," *Psychiat. Quart.*, April, 1943.
8 Federn, P.: "Psychoanalysis of Psychoses," *Psychiat. Quart.*, 17: 1, (Jan.-Apr.) 1943.

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Presentation of Case

A 50-year-old married white man was admitted to the hospital on January 19, 1943. On January 8 dizziness and staggering had begun suddenly while at work, and was followed in several hours by slight abdominal pain, vomiting, diplopia, tinnitus, and occipital headache. Taken home by a fellow worker, he went to bed, from which he arose only to go to the bathroom. He was said to have had occasional tarry stools during the week prior to admission. The headache and vomiting persisted and on January 16 he began to talk irrationally, having hallucinations and delusions about "spies" and being "knifed." He was unable to feed himself during this illness because he did not seem to be able to direct a spoon toward his mouth without shaking the food from it; his appetite remained good until three days before admission. On January 18 he became wildly confused and cried about the death of his mother which had occurred eight years before. He had lost 25 pounds over the previous three months. His latest weight had been 130 pounds. There had been occasional numbness in the fingers during the past two months. Pallor had been noted for several months.

The patient had suffered from dizzy spells for some time and for more than a year before admission patient had had occasional episodes of headache, vomiting or abdominal pain. On one occasion, several days of vomiting was associated with generalized abdominal pain and swelling. He had been taking one-half ounce of milk of magnesia daily for about a year.

The company physician supplied the following data: blood pressure record—Jan. 15, 1936, 140/100; Jan. 14, 1937, 135/90; Jan. 18, 1938, 170/100; Jan. 9, 1939, 175/100; Jan. 10, 1940, 180/110; Jan. 9, 1941, 180/100. In October 1941 this physician had diagnosed a stroke (headache and slight weakness left lower face and left arm) which cleared with complete bed rest for two weeks. On October 5, 1942, numbness and weakness developed in the left face and cleared in a few days. The blood pressure then was 230/110.

Pneumonia in 1927 had left him with a chronic cough. The patient had been operating a pressure pump in a lead factory for 31 years, handling metallic lead (not the salts). All that is known of his psychological structure prior to the present illness was that he was of "shy disposition" and an improvident sort of person. He was a steady worker and, according to the plant physician, never cared much about his health. This doctor

believes that he drank excessively, but his wife said that he drank only moderately. She was considered a "fairly reliable" informant. He was born in England and had been in this country since the age of 14. He had enlisted in the U. S. Army during the last war. During the last illness he recognized his wife and treated her with deference, though cursing and hitting himself in her presence. He had been married six years and was childless.

Examination—On the admission examination (January 19) he was restless and disoriented, and muttered to himself. However, he usually understood and responded fairly well. He was dehydrated. The lips were dry and cracked, the tongue dry and reddened. Two remaining teeth were carious; gums were normal. The only abnormal neurological signs on admission were slight papilledema, coarse horizontal nystagmus, and an extensor plantar response on the left. It was never possible to do sensory examinations; he withdrew the face and extremities from pin-prick.

Course—On the evening of the day of admission he became noisy. Paraldehyde was therefore used freely over the next two days. He was examined repeatedly up to the day of his death, and the significant findings of these examinations are noted. On January 20 he became noisy and belligerent when aroused from a stupor. The jaw jerk was hyperactive, and the plantar responses extensor. On January 21 he developed urinary retention and never urinated voluntarily thereafter. After January 21 he objected to passive movements of the upper extremities and would resist them, apparently because of pain. There was continual muttering when the patient was awake. The coarse nystagmus and extensor responses persisted until death. On January 25 bilateral temporal and occipital trephine exploration revealed no subdural hemorrhage. On January 26 he became quite dyspneic and cyanotic with the development of lobar pneumonia. He would arouse to mutter unintelligibly. There were periods of incessant, confused talking. He was able to take fluids until January 25. He died on January 27, his ninth day in the hospital.

Laboratory Data—The temperature, which was normal on entry, began to rise 12 hours thereafter and continued steadily upward to a high of 105 degrees F. (rectally) 20 hours before death. The pulse rate matched the temperature rise, to a height of 136, 20 hours before death. The respirations became labored and rapid with the onset of pneumonia. The blood pressure remained around 185/110 during the final illness. Blood counts before the onset of pneumonia were: red, 4.14 million; white, 6,600; the differential count was neutrophils 68 per cent, lymphocytes 28 per cent, and eosinophils 4 per cent. There was no note of abnormal cells in the single blood smear. The hemoglobin was 14 grams. The urine contained albumin; stool examination revealed no abnormality. The blood urea nitrogen was 54 mg. per cent on January 19, and 65 mg. per cent on January 22. A blood Kahn was negative. On January 22, roentgen plates of the skull were normal. A lumbar puncture was performed on January 19. The initial pressure was 140 mm. of water and after removing 8 cc. of slightly yellow clear fluid the pressure was 60 mm. The CSF contained 2 white cells per cmm., the total protein content was 95 mg. per cent, and the Wassermann and gold curve were negative.

Sixteen months before death, on September 30, 1941, a gastro-intestinal series was done at this hospital at the request of the family physician. The latter was unable to recall the complaint which led to this request, but it is more than likely that the roentgen study was coincident with the episode of abdominal pain and swelling. The stomach was normal. The duodenal cap was constantly deformed and tender, and there was spasm in the second portion of the duodenum. The duodenal loop was enlarged. On October 7, 1941, an oral cholecystogram visualized the gall bladder fairly well. There were no stones.

Differential Diagnosis

Dr. John Romano: Essentially, this is the story of a 50-year-old married white man with no significant past medical history other than pneumonia in 1927 which is said to have left him with a chronic cough. He was admitted to the hospital on January 19, 1943, eleven days after he had experienced sudden "dizziness," staggering and other signs suggestive of an acute cerebral vascular lesion. He died of pneumonia nine days after hospital entry.

Obviously, his occupational history is of paramount importance. While we know that he worked for many years in a lead factory, we know little or nothing of the quantitative

aspects of exposure, awareness of the management, preventive program, disability of other employees, etc. We do know he was seen by a company physician and in the period between 1936 and 1941, a series of annual blood pressure readings attested to the fact that the patient developed arterial hypertension. We know, too, that the patient had experienced acute episodes of headache and vomiting associated with generalized abdominal pain and distention. He must have been constipated, as he took daily doses of milk of magnesia for over a year.

In October 1941 he is said to have had a "stroke" with weakness of the left lower face and the left arm. Gastro-intestinal fluoroscopic studies revealed constant duodenal cap deformity.

The next pertinent note in the protocol records the acute catastrophe which necessitated his admission to the hospital. There examinations recorded confusion, dehydration, and lack of fever. The gums revealed no lead line. There was slight papilledema, coarse horizontal nystagmus, and an extensor plantar response on the left. In the course of the next few days he became increasingly confused, received considerable quantities of paraldehyde, developed urinary retention, became febrile and had bilateral extensor plantar responses. The day before his death, bilateral temporal and occipital trephine openings were made but no subdural hematoma was found. He is said to have developed pneumonia and died on his ninth hospital day.

Laboratory data showed increasing nitrogen retention, albuminuria, yellow cerebrospinal fluid with increased protein, and no pertinent blood findings. There was no note concerning basophilic stippling. There was no urine, blood, or stool examination for lead.

It appears that the differential diagnosis should consider:

1) Lead intoxication in which the disability associated with cerebral accident, mobilized lead from bone depots causing colic, and possibly cerebral and visceral vascular changes. Duodenal ulcer is problematic; the fluoroscopic findings were quite constant, though spasm is observed in lead intoxication.

2) Vascular disease, other than that associated with lead poisoning, probably associated with arteriosclerosis; unlikely associations are visceral Buerger's disease and periarteritis nodosa.

3) Chronic renal disease, probably on a vascular basis, and terminal pneumonia.

An unlikely possibility is neoplasm, primary in the gut, with metastases to the brain.

I believe the patient had two previous right hemispheral, cerebral vascular accidents; and with restitution in a short period of time, I would be led to believe the lesions were in the nature of thrombosis. The incident prior to his admission was probably responsible for the yellow color of the cerebrospinal fluid, which is indicative of bleeding. Whether the blood had direct connection, as with the leak of a vessel at the base of the brain or whether it extravasated through brain tissue is difficult to know. I think it most likely that he had primary subarachnoid hemorrhage.

It is my understanding that there is no specificity of the vascular changes in lead intoxication, nor are there specific changes in muscle, end plate, nerve, cord or brain. I think the primary disturbance in this man was due to lead intoxication.

Clinical Diagnosis

Lead encephalopathy.
Bronchopneumonia.
Arterial hypertension.

Dr. Romano's Diagnosis

Lead encephalopathy.
Subarachnoid hemorrhage.
Arterial hypertension.

Anatomical Diagnosis

Cerebellar hemorrhage, right hemisphere.

Multiple small areas of softening of the cerebrum, cerebral edema, and proliferative capillary change (consistent with the diagnosis of lead encephalopathy).

Bronchopneumonia.
Subacute glomerulonephritis.

Discussion of Pathology

Dr. I. Mark Scheinker: On gross examination of the brain, there was slight flattening of the gyri and a moderate degree of cerebral swelling. On coronal sections the most striking gross change was seen in the cerebellum. There a massive hemorrhage was found in the white matter of the right hemisphere involving the dentate nucleus. This massive intracerebellar hemorrhage was probably re-

sponsible for the sudden onset of staggering, vomiting, diplopia, etc. The remaining brain sections showed diffusely scattered, small areas of tissue softening. In addition, there was swelling of the white matter, chiefly seen in the right cerebral hemisphere.

The microscopic examination revealed the following changes: The pia arachnoid was thickened and hyperplastic in some areas. The thickening was due to distention of the meshes and infiltration with a variety of cells, most of them fibroblastic, and hyperplasia of connective tissue. In some areas there were large accumulations of macrophages. The larger blood vessels were thickened and moderately sclerosed. The smaller veins disclosed marked proliferation of the endothelial and adventitial cells.

The changes in the parenchyma consisted of scattered areas of softening, and hemorrhage. The former were localized chiefly within the white matter just beneath the cortex, and were in different stages of organization. Some of the softenings were characteristically acute anemic infarction; others contained some organization and glial repair.

In addition, there was to be seen diffuse ischemic degeneration of nerve cells; some of them, especially in the deeper layers, were surrounded and invaded by glia cells (satellitosis and neuronophagia). In some areas the ganglion cells showed advanced liquefaction. The architecture of the cortex was changed throughout, and was completely disorganized in various regions. In the white substance the oligodendroglia showed marked swelling, associated with a slight rarefaction of the tissue. In some areas there were signs of progressive changes of the glia; swelling of the nuclei associated with an abundance of chromatin and cytoplasmic processes, with a tendency to proliferation and accumulation in rows or clusters.

Striking changes were found in the capillaries. They showed marked endothelial and adventitial proliferation, and there was new formation of capillaries. The majority of capillaries was made up of swollen and proliferated endothelial cells which contained nuclei rich in chromatin and an appreciable amount of cytoplasm at the poles of the cells. These cells were frequently filled with greenish granules and were sometimes surrounded by a few macrophages. In some areas there were newly formed capillaries containing brightly stained, hypertrophied, endothelial cells with elongated cell bodies. Many new capillaries showed numerous budding formations. In some areas the entire field appeared to be covered with an abundance of proliferated capillaries containing hyperplastic endothelial and adventitial cells.

The walls of the larger vessels were appreciably thickened due to proliferation of the adventitial cells. The endothelial cells in large vessels were seldom increased in size. Some of the larger blood vessels were afflicted with a moderate degree of arteriosclerosis. A few of the smaller veins showed slight fibrosis and hyalinization of the vessel wall. Like the capillaries the larger vessels were not surrounded by perivascular infiltration.

It should be emphasized that while the parenchymatous changes are not specific in their character and may resemble those to be found in any type of structural vascular lesion (e.g., arteriosclerosis, hypertensive encephalopathy) the proliferative changes of the capillaries and leptomeninges are more characteristic, and possibly of etiologic significance. They are compatible with lead encephalopathy. The same findings in brain capillaries have been obtained in experimental lead poisoning.

Dr. Daniel Oscherwitz: Was the cerebellar hemorrhage due to hypertension?

Dr. Scheinker: There was diffuse disturbance of the entire brain; softening, rarefaction and edema, which was associated clinically with increased blood pressure. It is conceivable that the increase in blood pressure might have contributed to this picture. The usual telltale of hypertension, that is hyalinization of the capillaries, was present in minimal degree.

Dr. Charles D. Aring: Doctor Kehoe will discuss the analysis of the tissues for lead, and will, I hope, criticize the clinical handling in this case. He will inform us how to make the diagnosis of lead poisoning with reasonable certainty.

Dr. Robert A. Kehoe:* I would like to take up several points in the history which noted that this man was employed in a lead factory for 20 or 30 years. Nothing was said about the character of the work and whether it was hazardous or not. I should like to stress the importance of the physician finding out about

such aspects in a problem of this sort. While we may now consider it an academic problem, it is not that alone when one is dealing with a sick person. The employer has certain responsibilities, and under any circumstances, one is required to prove the diagnosis of lead poisoning beyond any reasonable doubt.

One should learn from the employer and plant physician more than was known in this case about exposure. However, it is fair to say that such information would have been misleading here. Inquiry would have established the fact that this man had been handling metallic lead in a cold extrusion process, an occupation which could well be non-hazardous. Metallic lead handled in the cold state, or even in the molten condition need not give rise to hazardous lead exposure. It is dangerous only if badly handled or if there is lead exposure from other types of operations in the same plant. In this instance inquiry would have shown that the employer considered this to be a non-hazardous occupation. The plant physician did not think this man had dangerous lead exposure. So having made further inquiry, one would have been led to conclude that in all likelihood this man had not experienced dangerous lead exposure.

Now with respect to the clinical findings, if the possibility of lead intoxication has been taken seriously during this man's lifetime, there should have been careful blood examinations with the idea of determining not only the degree and type of anemia, but the general character of the hematopoietic response. Whether this man had "stippled" erythrocytes or reticulocytes or damage to the peripheral blood elements is not known. All that one can say in this case is that we do not have this information. Another thing should have been done clinically. If lead was suspected one should have made lead determinations on the blood and urine to determine the extent of the recent lead exposure. If these analytical data were available, along with satisfactory information about the hematologic picture, one could arrive at a reasonably well founded conclusion as to the existence or non-existence of lead intoxication in this case.

Unfortunately we have only the post-mortem analytical results to guide us. These may be compared with the values obtained on corresponding tissues of persons with no special lead exposure.

Tissue	*Mg/100 gm. fresh tissue (This Case)*	*Mg/100 gm. fresh tissue (Normal)*
Lung	0.098	0.01—0.06
Heart	0.017	0.01—0.07
Kidney	0.17	0.01—0.16
Spleen	0.40	0.01—0.07
Liver	1.18	0.04—0.28
Brain	0.48	0.01—0.09
Flat Bone	15.20	0.21—1.11
Long Bone	16.25	0.67—3.59

This man died with some type of encephalopathy. One finds in his skeleton 14 or 15 times the concentration of lead that is normally found; in his brain, about 6 times the normal lead concentration, a concentration of the magnitude found in fatal cerebral lead intoxication. These facts, however, do not in themselves justify the diagnosis of lead encephalopathy. They merely demonstrate that this man had had serious lead exposure of a magnitude capable of producing lead intoxication. If one could obtain tissues from this man's associates in the same plant, one would probably find similar analytical results, despite the fact that these men may not have been ill. However, the analytical data do demonstrate quite clearly that the opinions expressed by the plant doctor and the employer were incorrect. It should be noted that the lead in the liver was nearly 10 times that found in normal individuals. It is clear therefore that this man had high lead concentrations in his soft tissues, and presumably he had a high content of lead in his blood. In other words, the lead was situated where it could do damage.

With this information one may now raise the direct question—did this man have lead encephalopathy? This question could have been answered only during this man's lifetime. If he had had high lead concentrations in the blood and urine, and if he had shown extensive changes in the peripheral blood (basophilia granulations well in excess of 1000 "stippled" erythrocytes per million erythrocytes), there would have been a strong presumption that he was suffering from lead intoxication.

Dr. Romano: If you were able to study the

tissues of men without symptoms in the same type of job, you feel you might find these values of lead in the soft tissues and bones?

Dr. Kehoe: Yes. Such values may be found without clinical signs of illness. These results merely show that this man's job was a dangerous one, that at the time of his death he had lead concentrations in his tissues which were compatible with the diagnosis of lead poisoning. In this instance it is a little difficult for me to arrive at a diagnosis of lead encephalopathy without qualification. With all due respect for the microscopic study, I must express skepticism as to whether the microscopic changes give specific evidence of cerebral lead intoxication. This may be the skepticism of ignorance and lack of experience about this particular point, but I am not convinced that there is a characteristic and specific histopathology of lead encephalopathy. Referring to a point Doctor Romano mentioned in his discussion of this case, I do not think that progressive general vascular changes occur as the result of lead absorption. No proof is available, and in my opinion the clinical evidence that is available is mainly to the contrary. This question can only be answered by properly planned and carefully executed clinical studies of industrial workers under conditions of exposure and non-exposure to lead compounds.

Dr. Romano: That is what Doctor Joseph Aub thought. What about acute lead encephalopathy; have there been any studies on individuals who have had direct exposure followed by mental and neurological signs?

Dr. Kehoe: I have seen the brains in a series of cases of acute lead encephalopathy in both men and animals not subject to prolonged lead exposure. In these cases the brain showed gross deviations from the normal, but the lesions were entirely non-specific. There was edema of either the wet or dry type, together with the vascular changes of acute intoxication or those seen with cerebral compression; there may be occasional petechiae, but there is little or no evidence of focal cellular lesions.

Lead encephalopathy in the adult, due to the absorption of inorganic lead compounds is a fairly rare disease. I believe I have seen four such cases in 15 years. Except in the case of children, it is not the common nervous reaction to lead. Therefore, one makes the diagnosis with a certain amount of reservation. It does occur, however, when individuals suffer very severe lead exposure over considerable periods of time. It never occurs as the result of lead exposure of slight or questionable severity.

Dr. Milton Rosenbaum: From the viewpoint of lead absorption, how could one explain the previous episodes which were diagnosed as "strokes"?

Dr. Kehoe: I would not attempt to explain these episodes on the basis of the effects of lead absorption. They may well have been the result of cerebral vascular accidents of relatively minor significance. Examination of the brain showed evidences of vascular disease of long standing with fibrotic change, and with hemorrhage a part of the terminal picture.

On the other hand, there were repeated episodes of gastro-enteric distress, including one so severe that a search was made for clinical signs of duodenal ulcer. The uncertain radiologic findings at that time, and the absence of post-mortem evidences of ulcer, suggest that this distress was functional in origin and may have been colic. It is entirely possible and in fact it seems to have been the case, that this man had both lead poisoning and vascular disease. No doubt some clinicians would combine the two diseases in one, holding that the lead absorption produced the vascular disease concurrently with chronic lead poisoning, and that "strokes" occurred from time to time on this basis. That, I think, is an oversimplification of the diagnostic problem presented here. I should like to have seen the patient in one of the episodes of "stroke" to have had the opportunity of better evaluation.

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*Dr. Kehoe is Research Professor of Physiology, University of Cincinnati, School of Medicine and Director of the Kettering Laboratory of Applied Physiology.

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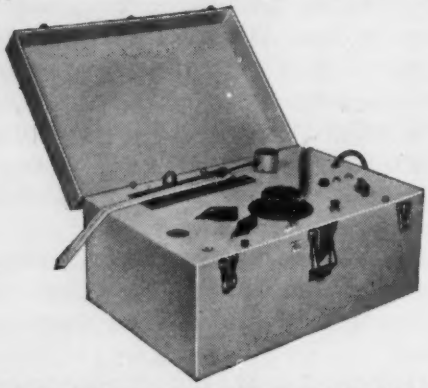

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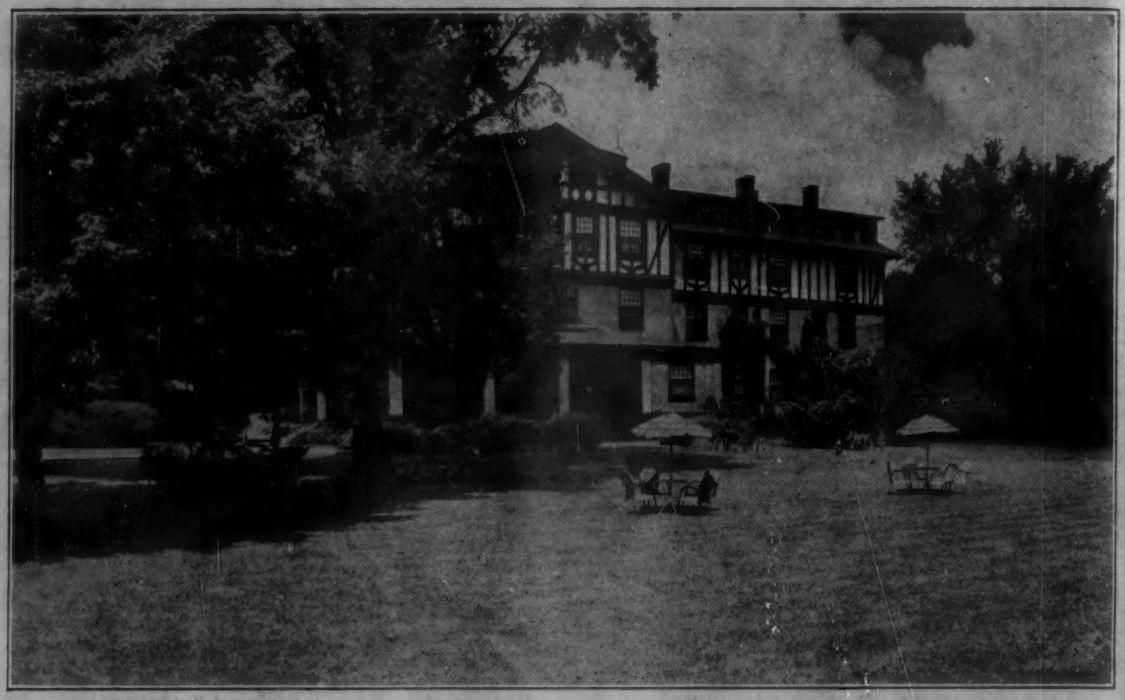

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